

ABSTRACT OF THE DISCLOSURE

[0027] A broadband receiving apparatus includes an antenna to receive a radio signal having a plurality of modulation frequencies. An amplifier drives a laser source from the broadband radio signal to produce an optical signal having a plurality of spectral components. A diffraction grating transforms the optical signal into its spectral components. An array of photo-detectors converts the spectral components into electronic signals corresponding to the plurality of modulation frequencies. A transmitting apparatus includes an array of coherent laser emitters driven by electronic signals corresponding to a plurality of modulation frequencies to produce optical signals corresponding to a plurality of spectral components. A diffraction grating inverse transforms the spectral components into a composite optical signal. A photo-detector converts the composite optical signal into a composite electronic signal including the plurality of modulation frequencies. An amplifier amplifies the composite electronic signal for transmission as a broadband radio signal.